Returns on Equity to Not-For-Profit Hospitals: Theory and Implementation

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It is argued that not-for-profit hospitals can be assumed to generate a return on equity capital due, in principle, to competition in the final product market for hospital services and in the capital market. Practical difficulties in identifying claimants to the net income of the firm, as well as the incentive problems of cost-based reimbursement, suggest that a competitive pricing approach is likely to be the appropriate means to provide a reasonable return on equity for the not-for-profit and the for-profit hospital. Implications of the analysis for the correct discount rate in investment decisions are outlined.

INTRODUCTION

This article applies the modern theory of corporate finance to argue for payment of a return on equity capital to not-for-profit hospitals. The analysis extends the earlier work of Long and Silvers [1] and Long [2, 3]. Their pioneering work argued for the relevance of corporate finance principles (modeled on the theory of the for-profit firm) to the not-for-profit health care sector. In particular, these authors have challenged the conventional wisdom in the health care literature, which suggests that the economic principles to be used in investment decision-making and cost of capital determination are somehow different in for-profit versus not-for-profit firms. The aim of this article is to build on their insights and to pursue more completely the theoretical and empirical implications of their work.

A recent statement of the Principles and Practices Board of *Hospital Financial Management* [4] reinforces the timeliness of considering the return on equity to not-for-profit hospitals. The board's statement encourages experimentation with the "return on equity owners' capital"

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concept by *both* tax-exempt (not-for-profit) and investor-owned hospitals. The statement correctly emphasizes that the term "owners" is used in a broad sense—stockholders for investor-owned hospitals, the community or sponsoring body for not-for-profit hospitals. The return on owners' equity represents payment for the use (i.e., past investment) of capital, and future uses of that capital are a completely separate matter. Under this concept, the return on equity compensates investors for their opportunity costs of past investment. Once recovered, the return on owners' equity would be used by representatives of the owners as they deem appropriate. The logic of the board's statement conforms closely to the analysis that will be presented in this article.

Recent controversy suggests that the payment of an equity return to the not-for-profit hospital is far from a settled issue. For example, the Medicare Provider Reimbursement Review Board's (PRRB) decision that not-for-profit hospitals are entitled to a return on equity capital was overturned by the Health Care Financing Administration [5]. The reversal centered on the PRRB's lack of authority to set aside existing regulations, but it also clearly suggests dispute over the conceptual merit of paying an equity return to the not-for-profit hospital.

CONCEPTUAL FRAMEWORK FOR MEASURING RATE ON EQUITY CAPITAL

Fundamental to this discussion is the recognition of the meaning of not-for-profit in the context of the firm. Not-for-profit hospitals do earn accounting profits, i.e., the excess of revenues over accounting expenses, but the key to their not-for-profit status is that no shareholders have explicit claim to this residual income. The retained earnings of the nonprofit health care firm accumulate over time as equity (or "fund balances") on the balance sheet of the institution.

Precisely because property rights to the residual income of the not-for-profit enterprise are not well defined, it is argued [6] that such firms will plough these resources into incremental[1] fixed capital investment, manager perquisites, charity, and other opportunities whose benefits can be captured by some combination of the managers, physicians, trustees, staff, and the broader community. Recognizing the incentive effects resulting from this property rights problem, regulators and payers in the hospital industry have generally denied return on equity payments to not-for-profit institutions.

I will argue that denial of a rate of return on equity capital to not-

for-profit hospitals is a conceptual error and that such a policy implies adverse incentive effects of its own for hospital behavior.

THE COMPETITIVE MARKET AS ANALYTIC BENCHMARK

To determine the correct rate of return on equity capital for nonprofits, one must analyze *final product* market as well as capital market conditions. Previous analysts [7] have focused on competition for funds in the capital market in arguing that nonprofits must earn a positive return on equity to attract investor (debt and equity) capital. Such arguments are correct as far as they go, but in my view, one can follow the logic several steps further.

First, it is true that not-for-profit (as well as for-profit) hospitals compete in the capital market for funds and must offer investors a risk-adjusted return which compensates them for the opportunity cost of that capital (rate of return in its next best alternative use). Therefore, to estimate this competitive rate of return, it will be useful to identify the suppliers of each type of capital and their next best alternative use of those resources.

The case of debt capital is reasonably straightforward. Not-for-profits participate in well-organized, competitive markets for short- and long-term debt, and the expected return required by lenders determines the marginal cost of debt capital to not-for-profits (non-Πs) and for-profits (for-Πs) alike. It should be noted that tax-exempt bond financings, which are available almost exclusively to nonprofits [8] (exceptions include industrial development bonds, pollution control bonds, and certain categories of real estate financing), provide a differential subsidy to the debt capital costs of these institutions. With other things equal, one would expect the differential subsidy represented by these relatively new provisions to have resulted in an increased market share for the non-Πs. In fact, however, investor-owned chains of hospitals have grown (and continue to grow) relative to the non-Πs—which suggests that "other things" are not necessarily equal among the for-Πs and non-Πs.

Data from the American Hospital Association [9] reveal that the for-profits have gained market share relative to nongovernmental not-for-profit, short-term general and other special hospitals during the 1971–77 period. For example, total admissions to the for-Πs increased by 36.4 percent over that seven-year period versus 12.9 percent in the

case of non-Π hospitals. In terms of capital formation, total assets (net of accumulated depreciation) in the for-Πs increased by 238.9 percent among the for-Πs versus 106.2 percent among the non-Πs. It appears that any capital financing subsidy to the nonprofit sector is being overwhelmed by offsetting forces.

What is more, the advantage of tax exemption for the non-Πs (which would permit the non-Πs to charge a lower supply price for their services or to offer nonprice benefits to consumers) undoubtedly has limited the erosion of the non-Πs' market share by the for-Πs. Even so, current trends suggest that the for-Πs are gaining relative to the non-Πs in spite of the latter's tax advantage.

The diminishing equity position of non-Π hospitals [10] is a signal that, whatever the required return on equity for those institutions, market prices for hospital services are not compensating investors sufficiently to attract those funds. Philanthropy, endowment, and retained earnings as sources of capital have diminished relative to debt in the post-Medicare period. Cost-based reimbursement by third-party payers, which provides some form[2] of return on equity only to the for-Πs, has made it more difficult for the non-Πs to attract equity capital and has encouraged the latter to search for alternative financing mechanisms, such as tax-exempt hospital bond issues, tax-exempt Federal Home Administration/Government National Mortgage Association 242 financings, and general-obligation bond financings[3] [10]. These trends offer a window to a natural market experiment, the results of which imply that the true cost of equity capital for the non-Πs is greater than zero.

Why, in the absence of a single well-defined set of equity investors (as shareholders are in the for-Π firm), should one believe that the non-Π firm faces the *same* (not just a positive) opportunity cost of equity as the proprietary firm operating in the same local market? The short answer is that, while equity investors are more difficult to identify for the non-Πs, they represent a factor input in the production of hospital services which must earn the same risk-adjusted return, regardless of whether the payment is in the form of a cash dividend, capital gain, or, as in the non-Π case, nonpecuniary benefits such as charity provided by the institution. At the margin, the equity investor is indifferent between supplying capital to a for-profit enterprise, where it yields an after-tax stream of dividends and capital gains, and to a not-for-profit firm, where the gains are in non-money terms.

The key principle is that, when a return on equity is not allowed by cost-based payers for the non-Πs, the effort to provide these intangible benefits is not undertaken by the firm. Unless creditors are to

become partial equity suppliers (which, in essence, is what the governmental loan guarantees and tax revenue-supported bond financings really represent), a resort to the debt markets is merely a symptom of this problem, not a solution to it.

In sum, it is argued that:

1. Equity investors do supply capital to non-Πs. Philanthropy and retained earnings represent examples of equity capital sources.
2. Equity investors do demand implicit compensation for the opportunity costs incurred when they supply capital to non-Πs versus alternative income-generating investments.
3. The market price for services of non-Π hospitals must cover the opportunity costs of this equity investment, or the supply of equity capital to non-Πs will be shifted to other uses. The equity capital component of price is compensation for past investments.
4. Thus, the fact that the future uses of the equity returns are not well defined for the not-for-profit hospital—because no stockholders hold explicit claim to the non-Π's residual income—does not alter the need to recognize the opportunity costs (past opportunities foregone) of equity when pricing the services of not-for-profit hospitals.

As a concrete illustration of this argument, consider the non-Π which has received no philanthropy or government grants. Retained earnings would constitute the only potential source of equity capital for that institution. If the non-Π were not permitted an operating margin by third-party payers (margin representing the return on equity), then no retained earnings would be generated. In this case, the non-Π would be completely financed by debt. Assuming (as is reasonable) that the business risks of non-Π and for-Π hospitals operating in a local market are identical, the expected returns on total capital investment would be identical across the non-Π and for-Π hospitals. In this extreme case, the creditors of the non-Π are economically equivalent to equity investors. Accordingly, they demand returns equal to those for equity investments of comparable risk in other industries. Hence, even though an equity return *nominally* is denied by the third-party payer, an equivalent return effectively is paid to the creditors of the non-Π.

This reasoning demonstrates that the failure to recognize an explicit equity return only *shifts* the payment of that return to another capital source (e.g., the creditor). Investments in real assets by non-Πs

do not stop because third-party payers deny an explicit return to the non-IIs' equity. Instead, non-IIs search for alternative sources of financing, such as debt, philanthropy, and government grants.

The equilibrium condition for this search process is shown in Equation 1:

$$MC^N_{dk} = MC^N_{ek} = MR^N_{ek} = MR^o_{ek} \quad [1]$$

where MC^N_{dk} = the marginal money cost of debt, d, for investment in a real asset, k, by the non-hospital;

MC^N_{ek} = the marginal opportunity costs (including administrative costs) which the non-Π hospital incurs to attract capital from an equity source, e, which requires zero money returns (e.g., philanthropy) for investment in a real asset, k;

MR^N_{ek} = the expected marginal returns (presumably nonpecuniary returns for the philanthropist), which the equity financing source, e, perceives from the investment, k;

MR^o_{ek} = the expected marginal returns which financing source, e, demands for other income-producing investments with comparable risk to investments, k.

In words, the denial of an equity return will induce non-IIs to search for "free" capital, but ultimately the same equity returns must be paid by the not-for-profit hospital. Whether payment is in the form of interest on debt or the search costs incurred by non-IIs in seeking to attract philanthropy, these are real social costs which cannot be avoided. The philanthropist will demand a demonstration that the value of the hospital's investment is equivalent to that of financial opportunities of comparable risk, even though the payoff to donated capital is in nonpecuniary terms.

I am arguing essentially that donations represent a secondary market for the investment funds of the philanthropist and that the returns demanded in the primary market for income-generating securities are a signal of the return required by the philanthropist in this secondary market. This procedure is analogous to measuring the mar-

ginal opportunity cost of an individual's time in household activities by the compensation he or she would otherwise receive in the labor market. Where the philanthropic contribution is for a restricted purpose, the same reasoning applies. In this case, however, the contributor specifies the investment project to be undertaken. The intriguing empirical implication is that one might measure a series of average realized returns on such investment projects in order to estimate the expected returns implicitly demanded by those investors who provided the donations.

COST-BASED REIMBURSEMENT AS A TAX ON EQUITY

Cost-based reimbursement's failure to provide a return on equity capital has effects on the not-for-profit hospital which are equivalent to those of the corporate income tax on the for-profit firm. Long and Silvers [1] had the key insight that cost-based hospital reimbursement acts as a tax on the excess of charges over cost, and they pointed out the economic equivalence of the corporate income tax and cost reimbursement's "expropriation of margin."

Just as the deduction of interest from taxable corporate income creates a subsidy for debt in the firm's capital structure, the failure to pay a return on equity to non-Πs effectively "taxes" their equity investors. Debt is favored relative to equity in the non-Π firm by this feature of cost-based reimbursement in the same way that the tax subsidy to debt (due to the deductibility of interest payments from the corporate income tax liability of the firm) operates for proprietary firms in the general economy. Long and Silvers [1] were emphasizing that not-for-profit hospitals, while nominally tax exempt, actually pay a hidden tax due to this cost-reimbursement effect. I am stressing, in addition, that one aspect of cost reimbursement imposes a tax which falls specifically on equity capital.

By itself, the tax on equity implied by cost-based reimbursement would lead non-Πs to finance investments with 100 percent debt. However, there are at least two reasons to expect that non-Πs will maintain some equity in their capital structures:

1. The implicit tax can be avoided in cases where payment is based on charges (e.g., self-pay patients and patients covered by charge-based third-party payers).
2. Raising debt incurs real costs; and since creditors realize the

incentive effects of debt on a firm's behavior, definite limits exist on the level of debt supplied to firms. In the next section I discuss these incentive effects, often referred to as the "agency costs" of debt.

AGENCY COSTS OF DEBT

Whereas a capital structure of 100 percent debt would maximize the value of the cost-reimbursement advantage to debt, one observes actual leverage ratios in the neighborhood of 50–60 percent (expressed in book value terms, which only approximate the theoretically correct measure in market value) among not-for-profit hospitals. Bond-rating agencies, e.g., Moody's and Standard and Poor, have established industry norms for the ratio of long-term debt/total capitalization in the neighborhood of 0.67 percent for the hospital industry. Thus, there appear to be real costs of debt which partially offset its cost reimbursement advantage. We will discuss these under the rubric of agency costs.

The not-for-profit hospital represents an extreme case of the agency problem discussed in the economic literature. The managers of the non-Π firm act as agents for the community's interest in the nonprofit hospital. Since no shareholders hold explicit claim to the residual income of the firm, the potential exists for dissipation of that income in the search for private gains by managers, physicians, and board members. In fact, much of the literature on this problem reflects an attempt to discover the objective functions which non-Π hospitals use instead of current shareholder wealth (or firm value) maximization in making their decisions. Research centers on who "controls" the firm (cf. [11] for a model which posits the medical staff as a proxy for the owners of the not-for-profit hospital).

Despite who "controls" the firm, the central point is that the residual income claimants (whoever they are) have an incentive to invest in productive activities other than those which bondholders would choose. Myers [12] points out that investors (both shareholders and bondholders) are acquiring a claim on two income streams: (1) the income generated by assets already in place, and (2) the income from investments the firm is expected to make in the future (a real option). The total value of the firm is therefore the sum of the value of these two streams. If the shareholders must share the risky returns on future investments with bondholders, their incentive to invest in those real options is diminished. If certain investments with a positive net present

value are avoided because of such incentives, this value foregone is a real cost of risky debt.

The key to this incentive conflict between bondholders and owner-shareholders (community "stakeholders," in the case of a not-for-profit hospital) is that for a given expected return, the residual income claimants (i.e., owners) would prefer riskier investments than would the bondholders.

To demonstrate this conflict, consider the example in Tables 1A and 1B.[4] The simple comparison is between two one-period investment options—each requiring the same initial outlay at time $\emptyset$ (financed completely by the shareholders through a reduction in retained earnings) and yielding their respective payoffs at time 1. The other key features of the example in Tables 1A and 1B are as follows:

1. Under investment A, the probability that the shareholders will default on their promised payment of \$200 at time 1 to bondholders as of time $\emptyset$ is equal to 0.0, whereas the probability of default is 0.5 for investment B (since, if the condition of the market economy is "bust," the *total* returns available are only \$20). Expected returns for the bondholders are substantially higher under investment A, which they prefer to B.
2. Conversely, given the shareholders' limited liability under default (their returns = 0 in case of default, but the bondholders cannot capture any shareholder wealth beyond $\tilde{X}_1$), their expected returns are actually greater under investment B. Accordingly, the shareholders prefer B to A.
3. Assuming the firm's managers seek to maximize the wealth of shareholders, they will adopt investment B as long as the net present value of shareholder wealth is increased by doing so, i.e., if

$$\frac{\Delta \tilde{y}_1^s}{1 + k_B^S} - I_o = \frac{70}{1 + k_B^S} - 40 > 0$$

where k_B^S = the risk-adjusted discount rate for equity investments of identical risk to project B.

Thus, if $k_B^S = 0.75$ (a hefty discount rate, indeed), the shareholders would urge adoption of project B.

The presence of risky debt in the firm's financial structure induces the firm to make *socially* inefficient investment choices—that is, to acquire assets which do not maximize the wealth of shareholders plus bondholders. In the current example, even though the total *net* return

of project B is negative ($20/1 + k_B - 40 < 0$, where k_B is the discount rate appropriate to real assets of identical risk to project B), management would choose B if it were acting in the interests of the owner-shareholders. In this illustration the shareholders, in effect, shift some of the business risk of investments to the bondholders. Thus, the owners tend to favor riskier investments than do the bondholders. Unless this incentive conflict can be resolved costlessly, e.g., by side payments from bondholders to stockholders or by the design of mutually enforceable covenants when risky bonds are issued, it will give rise to such social inefficiencies.

To reinforce this point, notice that if no bonds were outstanding at time $\emptyset$, the shareholders would favor project A since it has the higher total net return. Unless the costs are zero for monitoring and enforcing socially efficient managerial behavior, shareholders will take advantage of limited liability to impose on bondholders part of the costs of risky investment choices.

In the current example, the difference between the net present value of projects A and B to bondholders and owner-shareholders as a whole

$$\left(= \left[\frac{60}{1 + k_A} - 40 \right] - \left[\frac{20}{1 + k_B} - 40 \right] \right)$$

measures the agency cost of risky debt [14].

Realizing these incentives on the part of owners, prospective creditors discount what they are willing to pay for the firm's bonds by the expected amount of these agency costs. These costs are borne fully by the equityholders, who try to minimize them. Such costs help explain why non-Πs (as well as for-Π firms) are not leveraged 100 percent.

In addition, since "owners" are so loosely specified in the not-for-profit hospital, the non-Π probably faces even greater difficulty in negotiating contracts with creditors which resolve this incentive conflict. If true, this would imply relatively higher agency costs to risky debt for non-Πs versus for-Πs. How much greater these agency costs of risky debt might be for the non-Πs poses an interesting empirical question, because an active market for management contracts and the possibility of takeover by investor-owned chains place limits on the extent to which managers, physicians, and other residual income claimants can shift risk to the bondholders. That is, a competitive market for control of the non-Π firm provides a degree of protection for the bondholders.

In addition, Fama [15] has argued recently that the existence of an efficient market for managerial labor serves to minimize these agency

Table 1A: Investment Options *A* and *B*—Initial Outlay (Time ∅) and Payoff (Time 1)

	No New Investment			*With Investment A*			*With Investment B*		
	Time ∅	*Time 1*		*Time ∅*	*Time 1*		*Time ∅*	*Time 1*	
		"Boom" (p = .5)	*"Bust"* (p = .5)		*"Boom"* (p = .5)	*"Bust"* (p = .5)		*"Boom"* (p = .5)	*"Bust"* (p = .5)
1_o	0			40			40		
$\tilde{Y}^S_o$	200			160			160		
$\tilde{X}_1$		240	120		280	200		380	20
$\tilde{Y}^S_1$		40	0		80	0		180	0
$\tilde{Y}^B_1$		200	120		200	200		200	20

1_o = initial investment outlay.

$\tilde{Y}^S_o$ = time ∅ net cash flow to *shareholders* (owner/stakeholders in not-for-profits).

$\tilde{X}_1$ = time 1 total *firm* net cash flow (= $\tilde{Y}^B_1 + \tilde{Y}^S_1$).

$\tilde{Y}^S_1$ = time 1 net cash flow to shareholders (= $\tilde{X}_1 - \tilde{Y}^B_1$).

$\tilde{Y}^B_1$ = time 1 actual payment to time ∅ bondholders, given *promised* time 1 payment of $200.

Table 1B: Comparison of Investments *A* and *B*

	Investment A	*Investment* B
Initial investment outlay 1_0 (borne by shareholders)	40	40
Total expected time 1 incremental return $(\Delta\bar{X}_1)$*	60	20
Expected time 1 incremental return to shareholders $(\Delta\bar{Y}_1^S)$†	20	70
Expected time 1 incremental return to bondholders $(\Delta\bar{Y}_1^B)$‡	40	-50

*$\Delta\bar{X}_1^A = 0.5(280-240) + 0.5(200-120) = 60.$

$\Delta\bar{X}_1^B = 0.5(380-240) + 0.5(20-120) = 20.$

†$\Delta\bar{Y}_1^S(A) = 0.5(80-40) + 0.5(0-0) = 20.$

$\Delta\bar{Y}_1^S(B) = 0.5(180-40) + 0.5(0-0) = 70.$

‡$\Delta\bar{Y}_1^B(A) = 0.5(200-200) + 0.5(200-120) = 40.$

$\Delta\bar{Y}_1^B(B) = 0.5(200-200) + 0.5(20-120) = -50.$

costs. Specifically, so long as wage opportunities for managers (i.e., their income prospects in future jobs) reflect information regarding their performance in current employment, the labor market itself will mitigate managers' incentives to depart from investment choices which maximize the value of the firm. Moreover, individual firms will share the risk of nonvalue-maximizing investment choices with managers by adjusting their compensation after cash-flow results of those choices are realized (what Fama terms "ex post settling up"). Notice that this argument does not depend on the existence of a capital market for equity securities. Thus, the logic is directly applicable to the not-for-profit hospital.

PRACTICAL AND EMPIRICAL IMPLICATIONS

PRICING POLICY

This article has attempted to demonstrate that, in principle, nonprofit and for-profit firms operating in product markets of the same risk will pay (implicitly in the case of the non-Π) the same expected return to equity capital. The incentive problem of how to allocate that residual income among an ill-defined set of claimants (the community) should not obscure the reality that such equity returns must be paid to compensate investors for the opportunities foregone by supplying their capital to the not-for-profit hospital.

The debt markets conduct a daily natural experiment in illustrating this point: the firm without such retained earnings and without an adequate level of fund balances (the not-for-profit book value equivalent of owner's equity on the balance sheet) cannot even attract credit. As the non-Π's equity position approaches zero, the riskiness of existing debt increases and with it the rate of return demanded. Thus, cost-based payers do not necessarily obtain a net social savings when an explicit equity return is denied to the non-Πs. Instead, this cost is merely shifted through the increased riskiness of outstanding debt.

This is not to say that the agency or incentives problem should be ignored in designing payment arrangements which recognize the opportunity cost of equity capital for not-for-profit hospitals. Rather, the analysis of this paper suggests that hospital rate-setting bodies and third-party payers should use an estimate of *competitive prices*, not aggregate revenue/cost or return on assets criteria, as their benchmark.

The danger in using return on assets or aggregate margins of revenue over cost is the incentive they create for institutions to inflate the asset or cost base used to determine allowable revenues. This incentive problem has stood in the way of recognizing the fact that equity capital is required and must earn a competitive rate of return in the not-for-profit hospital. If payment regulators were to "bite the bullet" and try to determine competitive prices for hospital service by examining hospital prices in relatively unregulated markets favorable to interhospital competition, they would be making the best effort possible.

An example will illustrate how competitive pricing might work. First, the approach centers on the prices of specific hospital services, not the overall level of average revenues per adjusted inpatient day (or other proxy statistics for hospital output). The payer must decide which local market areas and, therefore, which set of hospital prices will be used as the starting point for determining a competitive price schedule. Differences among market areas in the level of cost-of-living would be used to adjust the payer's proposed hospital pricing schedule to reflect the general price level in that market area. The indexes developed by the Bureau of Labor Statistics, e.g., the budget for a medium living standard of a family of four, could be used to control for differences among market areas in cost-of-living.

The essence of this approach would be to sever the *direct* link between allowed price and the individual hospital's accounting cost. Instead, payers would begin by quoting a price they are willing to pay for specific services, and negotiation with hospitals would establish the final price schedule. This kind of negotiating process would simulate

the workings of a competitive market, since it would substitute payer/provider bargaining for the present mechanism of cost-based determinations.

To the extent that truly competitive prices are not observable at a given point in time, payers might seek to approach competitive prices dynamically. Contracts between consumer groups, as represented by third-party payers, and providers, such as health maintenance organizations (HMOs) and hospitals, might be negotiated in the context of competitive bidding. Voluntary contracting among payers and providers (such as HMOs and hospitals) is likely to be the most promising model for such an approach. For example, Blue Cross payments to participating hospitals offer an incentive for hospitals (in the form of reduced payment for subscribers who receive care in nonparticipating hospitals) to deliver favorable contract terms—including relatively low prices. The specifications of such contracts might be used by payment regulators (e.g., Medicare, Medicaid) as proxy signals for competitive prices.

The competitive contracting approach outlined here has been discussed in more detail in the American Hospital Association's Report on the Regulatory Process [16]. What is more, empirical demonstrations of negotiated price-based hospital payment do exist. For example, the controlled charges approach of four Blue Cross plans—in Indiana, Kentucky, Missouri, and North Carolina—establishes charges that hospitals voluntarily accept for their self-pay and Blue Cross patients. Under this kind of payment method, the return to equity capital for the non-Π (as well as the for-Π, which would be paid the same price for the same service) is earned, rather than quoted as an accounting number. The only way for the individual hospital facing given prices for services to provide a return to equity for its investors would be to minimize operating costs, thereby providing a residual income to its stakeholders. The approach outlined here is complementary to the proposals of Alain Enthoven [17]. His focus is on increasing competition among insurers, which indirectly supports competition in the health services market by creating incentives for third-party payers to contract with efficient providers.

The alternative of pegging returns to specific inputs—labor, fixed capital equipment (through payment of interest and depreciation), debt, and estimated equity capital—provides the entrepreneur with incentives to inflate the rate base but does not offer an explicit marginal gain to providing services. Especially in the non-Π sector, where property rights to ownership of the hospital are not clearly delineated, it would be folly to provide equity payments which are not linked to

services but instead are calculated from book values on the firm's balance sheet. A brief story from Washington suggests why the cost-accounting approach to paying equity returns will not work.

Washington State nursing home reimbursement illustrates the practical problems associated with explicit payments for input components. Nursing homes receive a per diem allowance for historical depreciation. In the recent period of rising prices, and subsequent rising capital replacement costs, several nursing homes have borrowed substantially against the rising value of their assets. The Department of Social and Health Services now pays an explicit return on net equity, defined as:

book value of fixed assets - accumulated depreciation
+ working capital - outstanding long-term debt.

The irony is that the borrowing activity of nursing homes has diminished the base against which the equity return is calculated, so a substantial number of nursing homes cannot take advantage of the increased value of their equity.

INVESTMENT DECISIONS

While I have argued that competitive prices should be the model for hospital reimbursement (thus allowing equity to acquire its return indirectly, rather than by the hospital staking its claim to a payment based on balance-sheet values), explicit rate-of-return calculations are necessary if hospitals are to make investment decisions which maximize the firm's net present value. Again, I would suggest a kind of competitive market benchmark, to guide hospitals away from reliance on balance-sheet figures in their investment decisions. Investment decisions must evaluate the discounted market value of cash *flows*, whereas the balance sheet reflects the historical value of a firm's *stock* of assets.

Finance theory (cf. Fama [18]) suggests that the appropriate discount rate to use in evaluating the net cash flows from a given investment opportunity should reflect the marginal risk of that opportunity. In other words, the relevant measure of project risk is the incremental contribution of a project to the risk of the firm's total portfolio of investment opportunities.

The capital asset pricing model (CAPM) of modern portfolio theory [19–21] provides the basis for estimating risk and expected returns proposed in this article. Equation 2 presents an algebraic statement of the CAPM:

$$\bar{r}_i - r = \beta_i (\bar{r}_m - r_F) \quad [2]$$

where $\bar{r}_i$ = the expected return on the security i (e.g., share of common stock of firm i);

r_F = the expected return on the riskless security, usually defined operationally as the return on 91-day U.S. Treasury bills;

$\bar{r}_m$ = the expected return on the market portfolio of all securities in the economy, weighting each by its share of the total value of securities within that market portfolio;

and

β_i = *beta*, which is calculated as the covariance of returns on the ith security with the market portfolio (σ_{im}) divided by the variance of the market portfolio (σ_m^2): $\sigma im/\sigma_m^2$.

More complicated versions of the model, e.g., adjusting for unanticipated inflation, multiperiod decision-making, and skewedness of the returns distribution, have been developed; but this variant of the CAPM suffices to make my fundamental points:

1. The risk of an investment opportunity is related to the correlation of its returns with the returns in the general market economy. Assuming that other risks can be eliminated by holding a well-diversified portfolio, the market compensates investors only for systematic (or covariance) risk.
2. Accordingly, the not-for-profit hospital might use the β_i estimated for the equity securities of for-profit hospitals in markets of comparable risk as a proxy for the systematic risk borne by the former's equityholders, e.g., the community "stakeholders."

   A practical indicator of similar risk conditions would be the similarity between the sensitivity of supply/demand conditions for hospital services to economy-wide trends in the market for non-Π hospital i and the for-Π hospital(s). The current status and prospects for rate regulation and prospective reimbursement will directly influence the expected equity and debt returns. Previous work by Peltzman [22] reveals that by affecting the firm's systematic risk, regulation will affect equity returns indirectly through its impact on *beta*.

As a first approximation to the appropriate discount rate for investments whose marginal risk matches the prevailing risk of the firm's activities, I propose the following weighted marginal cost of capital measure:

1. The financial feasibility study supporting the investment project would determine the marginal proportions of debt (W_d) and equity (W_e) used in financing the project, with W_d and W_e becoming the weights in the weighted marginal discount rate for the opportunity.
2. Prevailing expected returns (derived from the CAPM) on debt and equity securities among for-profit hospitals in comparable market and risk conditions would be used to estimate the r_d and r_e specific to the investment project.
3. The discount rate for the project would be calculated as $W_d r_d + W_e r_e$. In measuring W_d and W_e, the correct denominator in the weight is the net present value of the project *plus* the investment outlay required. This is consistent with maintaining the optimal capital structure of the firm. Optimal leverage (W_d) is tied to market value of the firm inclusive of the increment gained from the project.

The above calculation, while not trivial to implement, provides economically correct guidelines to investment choices. Such a measure uses full information from the financial feasibility study concerning the optimal financing proportions for the project; it incorporates the best available market proxies for the opportunity costs of debt and equity capital. In Table 2, I provide a numerical example of how one might compute such a discount rate.

After demonstrating how the hospital financial manager might use available market information to calculate an appropriate discount rate for capital investments, it is important to recognize the nuances of certain key assumptions underlying this calculation:

First, I have formulated the discount rate as a weighted marginal cost of capital; and, while I have incorporated project-specific information (e.g., financing proportions) in the proposed measure, the manager inevitably will wish to adjust the estimated discount rate when the characteristics (e.g., systematic risk) of a specific project are believed to differ from those embodied in current capital market conditions. For example, the β of for-profit hospital companies reflects the value of their current assets in place (tangible assets) plus any future investment opportunities with positive net present value (termed "growth opportu-

Table 2: Calculation of a Discount Rate for Hospital Investment Decisions

Concept	*Calculation*	*Data Source*
1. *Marginal cost of debt capital*: measured by promised yield on specific investment opportunity being evaluated; adjusted for the probability that hospital will default on obligation	r_d = (promised interest return in dollars per period ÷ face value of debt for specific investment) × (1 - probability of default)	Promised returns and face value of debt are derived from terms of debt contract; default probability must be estimated by financial manager
2. *Marginal cost of equity capital*: estimated from the β_i, i.e., systematic risk, of common stock of for-profit hospitals operating in environments of comparable risk, return on riskless security ($\bar{r}$) and expected returns on value-weighted market portfolio ($\bar{r}_m$)	r_e = cost of equity capital = return on the riskless security + β_i (expected returns on market portfolio minus the return on the riskless security)	β_i of for-profit hospital companies is available from *Value Line Investment Advisory Services*; expected return on market portfolio can be approximated by the Standard and Poor 500 index, and return on riskless security can be estimated by the return on 91-day Treasury bills
3. *Discount rate for hospital investment*: estimated as a weighted average of marginal costs of debt and equity capital, where the weights sum to 1.0 and represent the respective shares of debt and equity in gross market value of specific investment being evaluated (gross value = total outlays for investment + its incre-	Discount rate = (share of debt in the specific project × cost of debt) + (share of equity × cost of equity)	Sources for cost of debt and equity as above; share of debt (W_d) can be approximated as face value of debt used to finance specific investment being evaluated ÷ total investment outlays; share of equity (W_e) = 1 - share of debt

mental contribution to value
of the firm, i.e., its net
present value)

Sample Calculation

Assumptions:

1.	Face value of debt	= 500,000
2.	Annual interest payments	= 75,000
3.	of the common stocks of for-profit hospital companies	= 1.50
4.	Annual proportional return on 91-day T-bills	= 0.12
5.	Annual return on market portfolio (based on S & P 500)	= 0.18
6.	Total investment outlays	= 1,000,000

Discount rate = $W_{d}r_{d} + W_{r}r_{e}$

$$= \left[\frac{500,000}{1,000,000} \times \frac{75,000}{500,000}\right] + \left(1 - \frac{500,000}{1,000,000}\right) \times$$

$[0.12 + 1.50\ (0.18 - 0.12)[1] = 1/2(0.15) +$
$1/2[0.12 + 1.50(0.06)] =$
$0.075 + 0.105 = 0.180$

nities"). Thus, the estimated β_i for these firms will overstate the β for their tangible assets. This implies that the financial manager may wish to adjust the *beta* up or down if the hospital's future opportunities (relative to current ones) are believed to be better or worse than those of the for-profit hospital firms.

Second, the common stock *beta* of for-profit hospital companies is positively related to the proportion of debt in their capital structures and to the riskiness of that debt. Therefore, the financial manager of the not-for-profit hospital will wish to adjust the for-profit *beta* when debt-financing proportions and/or riskiness of the project are significantly different from the conditions embedded in the *beta* of for-profit hospital companies.[5]

Third, the discount rate presented in this article is in nominal terms (unadjusted for inflation), so it is the appropriate rate for discounting nominal future cash flows. If the manager has converted future cash flows to real values, then Equation 3 shows how one would discount cash flows (given the assumption that a constant rate of inflation simplifies the presentation):

$$\text{Net present value of investment} = \sum_{t=1}^{n} \frac{\text{Nominal cash flow in period } t}{(1 + \text{nominal discount rate in period } t)^t} = \sum_{t=1}^{n} \frac{\text{Nominal cash flow in period } t \div (1 + \text{constant rate of inflation per period})^t}{(1 + \text{nominal discount rate in period } t)^t \div (1 + \text{constant rate of inflation per period})^t} \quad [3]$$

On the right-hand side of Equation 3, nominal cash flows have been converted to real cash flows by dividing the former by the compounded inflation factor. The same adjustment is applied to convert the nominal discount rate into a real rate.

The nominal and real discounting procedures are economically equivalent—the key is consistency between numerator and denominator in the calculations.

POSTSCRIPT

As a kind of postscript to this analysis, it should be pointed out that the flight of not-for-profit hospitals from equity capital sources into debt reflects an efficient capital market response to the agency problem of loosely specified claims to the residual income of the non-Π firm. As the non-Π hospital approaches 100 percent leverage, the creditors

effectively become equityholders and the problem of poorly defined property rights to the firm's net income vanishes (in the limit). This movement in the firm's capital structure is accompanied by a corresponding increase in the risk borne by the creditors. Accordingly, these capital sources will rely increasingly on the decisions of certificate-of-need (CON) agencies and third-party payers (including rate-setting bodies) in making judgments about where to direct their supply of capital.

One can predict that managerial discretion in the nonprofit hospital sector will be narrowed significantly, in effect, by such reliance on external decision makers. Fundamentally, the choice seems to be between: (1) a competitive pricing approach to hospital payment (for the for-Πs and non-Πs), which allows voluntary contracting between payers and providers and between investors and providers to minimize the risks of capital suppliers; and (2) a cost-based regulatory mechanism, which will lead not only to a more leveraged capital structure but to a greater reliance on external control of the non-Π hospital by CON agencies and rate-setting bodies. Such a choice should be considered explicitly as payers and providers evaluate alternative methods of payment for hospital services.

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NOTES

1. "Incremental" in this context means above the level which the value-maximizing proprietary firm would choose, *ceteris paribus*.
2. The return allowed by Medicare to for-profits, which is based on the book value of net invested funds, bears only an accidental relationship to the true opportunity cost of equity for those institutions, which depends on market value and risk.
3. FHA/GNMA 242 financings combine the interest rate advantages of the tax-exempt bond issue with the government guarantees of FHA/GNMA 242 financings. (The bonds are backed by GNMA certificates, which are guaranteed by the federal government.) In some states, nongovernment hospitals can obtain funds from general obligation bond financings, with the debt service paid from tax revenues.

4. This example is an adaptation of one presented in Haley and Schall [13], pp. 406–8.
5. Using the option-pricing model developed by Black and Scholes [23], one can show how the β_i of the firm's common stock is influenced by the share of debt (leverage) in the firm's capital structure and the default risk of the firm's debt. The firm's systematic risk, as measured by the *beta* of its total assets (β_v), equals:

$$\beta_v = W_d \beta_d + W_e \beta_e \quad [4]$$

Black and Scholes noted that the firm's common stock (equity) can be viewed as an option on the ownership of the firm's total assets, and that the option is exercised by paying off the bondholders. Default on those obligations to bondholders is equivalent to *not* exercising the option, where the price of exercising the option equals the face value of the debt (for the simple case of a bond paid off *in toto* at some future time, i.e., a "discount bond").

Given this insight, one can show that the β_e of the firm's equity obeys the following relationship:

$$\beta_e = \beta_v [1 - \textit{probability of default}] (1/W_e) \quad [5]$$

Thus, when the financial manager of a not-for-profit hospital uses the β_e of for-profit hospital companies to estimate the β_e for a particular investment opportunity, he should adjust the for-profit β_e up (down) accordingly, as the project's particular default risk and share financed by equity are lower (higher) than those of the for-profit hospital companies.

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